

General Description

The LTP 3564 is a high voltage, low power consumption and high performance LDO. The family uses an advanced CMOS process and a PMOSFET pass device to achieve fast start-up, with high output voltage accuracy. The LTP3564 is stable with a $1.0\mu\text{F}$ ~ $10\mu\text{F}$ ceramic output capacitor, and uses a precision voltage reference and feedback loop to achieve a worst-case accuracy of 3% over all load, line, process, and temperature variations.

Features

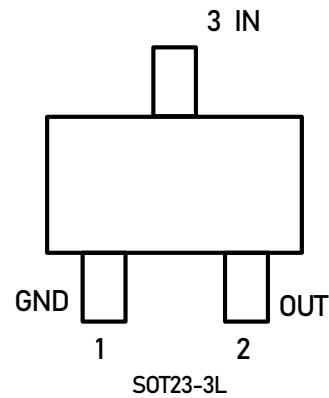
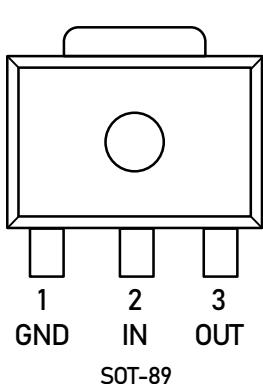
- Wide Input Voltage Range: up to 24V
- Output Current: 300mA
- Standard Fixed Output Voltage Options: 3.0V, 3.3V, 3.6V, and 5.0V
- More Output Voltage Options Available on Request
- Low I_Q : $1.8\mu\text{A}$ Typically
- Low Dropout Voltage
- Short current protection: 350mA
- Excellent Load/Line Transient Response
- Line Regulation: 0.05%/V Typically
- Available in SOT-89 and SOT23-3L Packages

Order Information (Ordering Number)

Model	Package	Ordering Number ^{Note1}	Packing Option
LTP3564	SOT89	LTP3564-xxXT4	Tape and Reel, 1000
	SOT23-3L	LTP3564-xxXT3	Tape and Reel, 10000

Note1: xx stands for output voltage, e.g. if xx = 18, the output voltage is 1.8V; if xx = 30, the output voltage is 3.0V

Pin Description

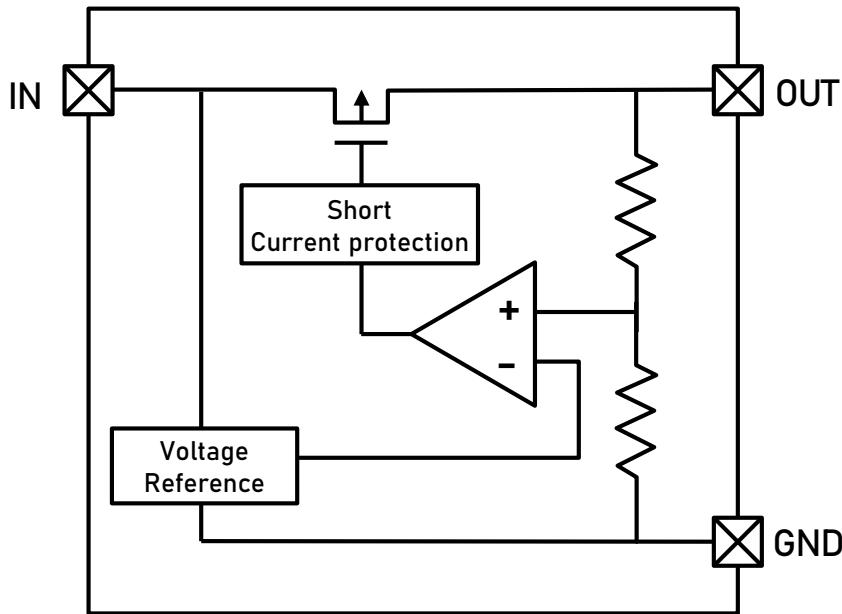


TOP VIEW

Pin Function

Pin No.		Pin Name	Pin Function
SOT-89	SOT23-3L		
1	1	GND	Ground.
2	3	IN	Supply input pin. Must be closely decoupled to GND with a 1 μ F or greater ceramic capacitor.
3	2	OUT	Output pin. Bypass a 1 μ F or greater ceramic capacitor from this pin to ground.

Block Diagram



Functional Description

Input Capacitor

A $1\mu\text{F}$ - $10\mu\text{F}$ ceramic capacitor is recommended to connect between V_{IN} and GND pins to decouple input power supply glitch and noise. The amount of the capacitance may be increased without limit. This input capacitor must be located as close as possible to the device to assure input stability and less noise. For PCB layout, a wide copper trace is required for both V_{IN} and GND.

Output Capacitor

An output capacitor is required for the stability of the LDO. The recommended output capacitance is from $1\mu\text{F}$ to $10\mu\text{F}$. Equivalent Series Resistance (ESR) is from $5\text{m}\Omega$ to $100\text{m}\Omega$, and temperature characteristics are X7R or X5R. Higher capacitance values help to improve load/line transient response. The output capacitance may be increased to keep low undershoot/overshoot. Place output capacitor as close as possible to OUT and GND pins.

Low Quiescent Current

The LTP3559, consuming only around $1.8\mu\text{A}$ for all input range and output loading, provides great power saving in portable and low power applications.

Short Current Limit Protection

When output current at the OUT pin is higher than current limit threshold or the OUT pin is short-circuit to GND, the short current limit protection will be triggered and clamp the output current to approximately 70mA to prevent over-current and to protect the regulator from damage due to overheating.

Absolute Maximum Ratings

Parameter	Rating		Unit
IN pin to GND pin	-0.3 to 28		V
Thermal Resistance (Junction to Ambient)	SOT-89	135	°C/W
	SOT23-3L	360	
Power Dissipation @ 25°C	SOT-89	750	mw
	SOT23-3L	280	
Operating Junction Temperature	-40 to 125		°C
Storage Temperature	-65 to 150		°C
Lead Temperature (Soldering, 10 sec)	300		°C
ESD (HBM mode)	ESDA/JEDEC JS-001-2017		±2000V

Electrical Characteristics

($V_{IN} = V_{OUT} + 2V$, $T_a = 25^\circ$, $C_{IN} = 10\mu F$, $C_{OUT} = 10\mu F$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Operation Range	V_{IN}			24		V
Dropout Voltage	V_{DROP}	$V_{OUT} = 3.3V, I_{OUT} = 50mA$ $V_{OUT} = 3.3V, I_{OUT} = 100mA$	160		320	mV
DC Supply Quiescent Current	I_Q		1.8	3		μA
Regulated Output Voltage	V_{OUT}	$I_{OUT} = 1mA$	$V_{OUT} \times 0.97$	$V_{OUT} \times 1.03$		V
Output Voltage Line Regulation	Reg_{LINE}	$V_{IN} = V_{OUT} + 1V$ to $30V$, $I_{OUT} = 10mA$ ($\Delta V_{OUT}/\Delta V_{IN}/V_{OUT}$)		0.05	0.2	%/V
Output Voltage Load Regulation	Reg_{LOAD}	I_{OUT} from $1mA$ to $50mA$ $V_{IN} \leq 35V$	60	100		mv
Maximum Output Current	I_{OUT}	$V_{IN} = V_{OUT} + 1V$	300			mA
Short Current Protection	I_{SHORT}	OUT short to GND	350			mA
Power Supply Rejection Ratio	PSRR	$I_{OUT} = 30mA$	$f = 100Hz$	45		dB
			$f = 1KHz$	39		
Output Noise	e_N	10Hz to 100kHz, $I_{OUT} = 30mA$,		200		μV_{RMS}

TYPICAL PERFORMANCE CHARACTERISTICS

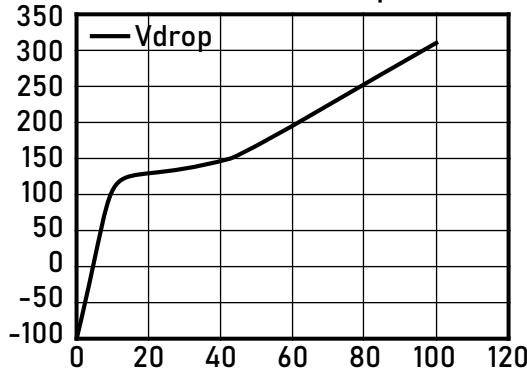
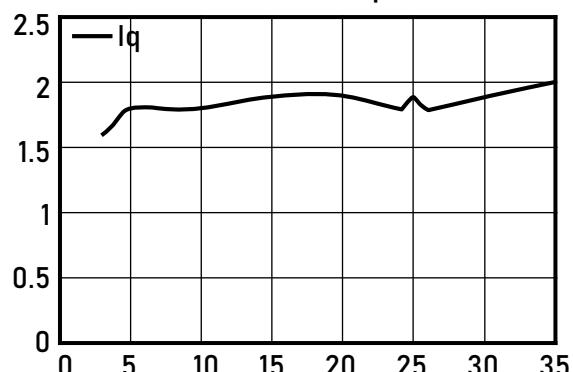
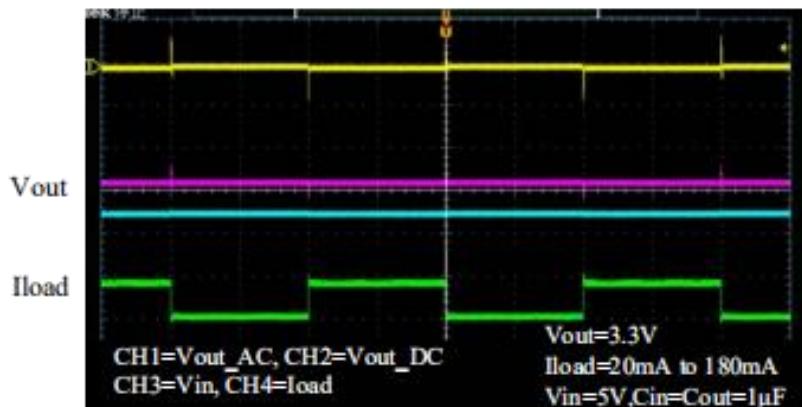
I_{out} VS. V_{drop}Fig1. I_{out} VS. V_{drop}V_{in} VS. I_qFig2. Vin VS. I_q

Fig3. Load-Transient Response

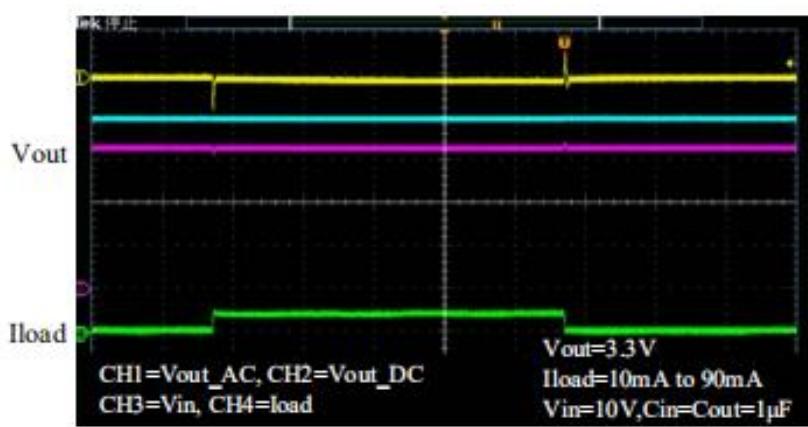


Fig4. Load-Transient Response

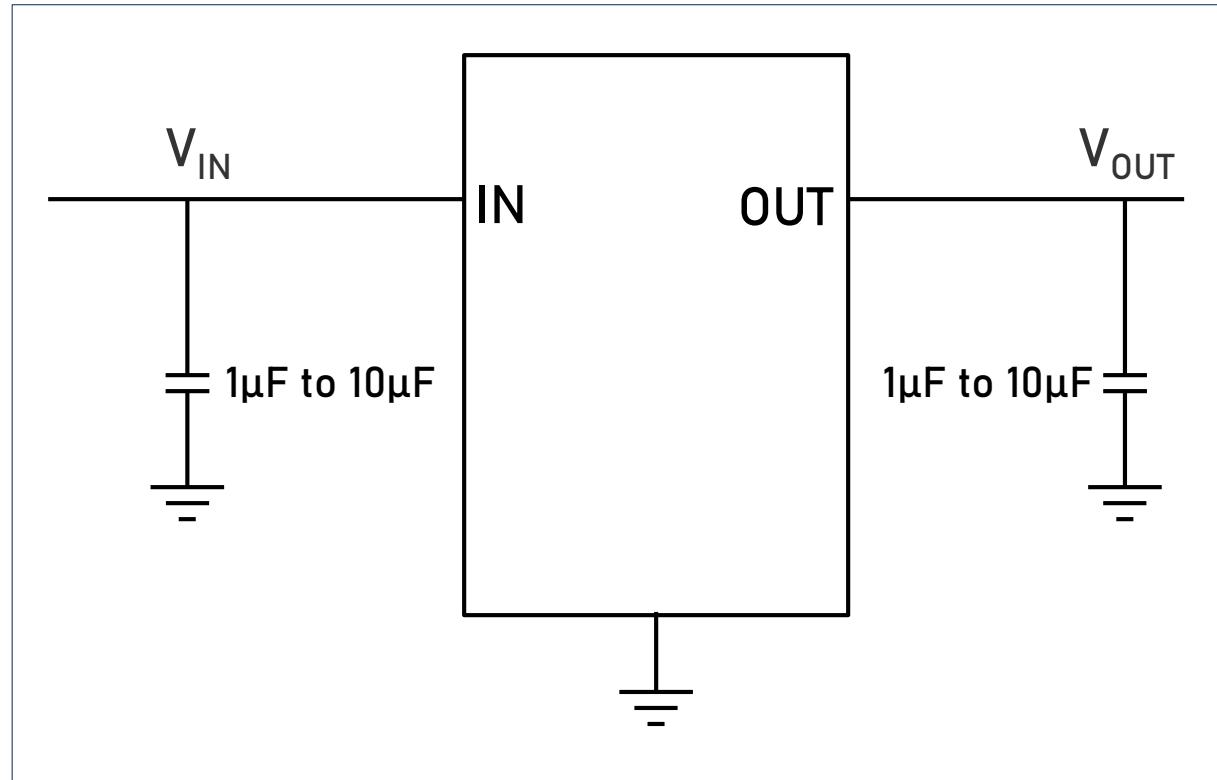
CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures.

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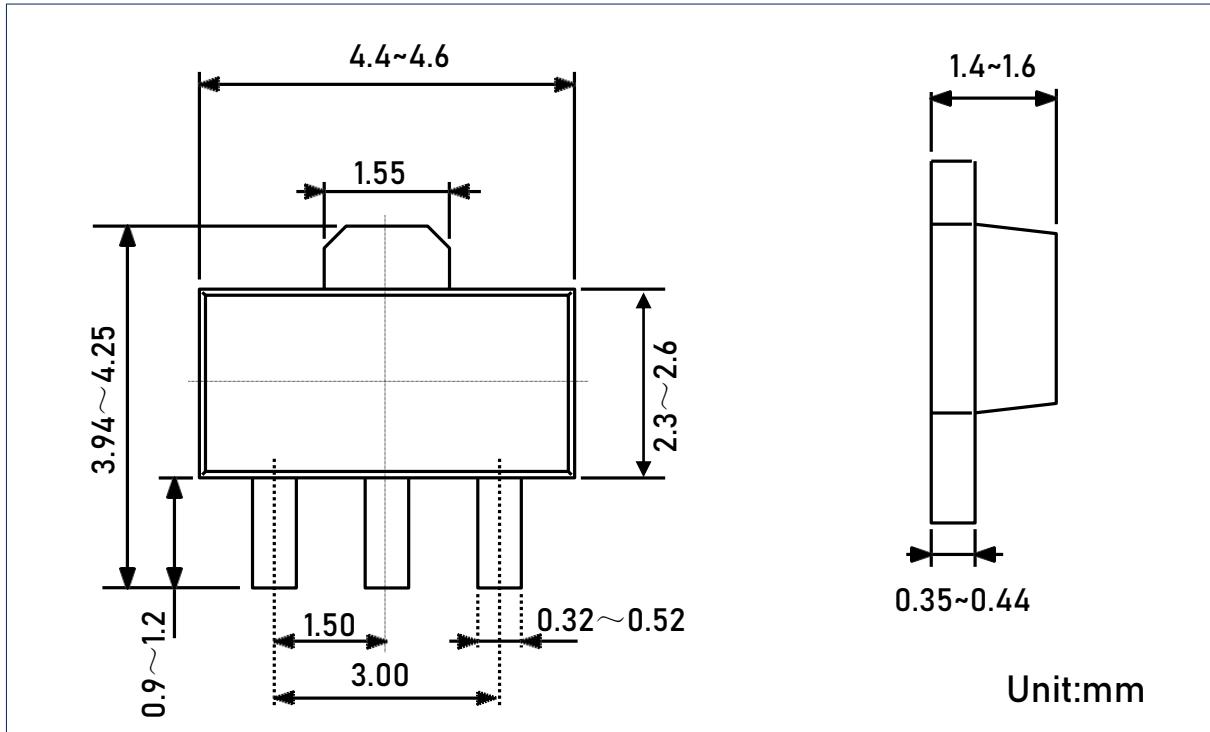
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Application Circuits



Package Dimension

SOT-89



SOT23-3L

